



DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RTID 0648-XC010

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to Site Characterization Surveys offshore from Massachusetts to New Jersey for Vineyard Northeast, LLC

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice; proposed incidental harassment authorization; request for comments on proposed authorization and possible Renewal.

SUMMARY: NMFS has received a request from Vineyard Northeast, LLC (Vineyard Northeast) for authorization to take marine mammals incidental to marine site characterization surveys offshore from Massachusetts to New Jersey, including the area of Commercial Lease of Submerged Lands for Renewable Energy Development on the Outer Continental Shelf Lease Areas OCS-A 0522 and OCS-A 0544 (Lease Areas) and potential offshore export cable corridor (OECC) routes to landfall locations. Pursuant to the Marine Mammal Protection Act (MMPA), NMFS is requesting comments on its proposal to issue an incidental harassment authorization (IHA) to incidentally take marine mammals during the specified activities. NMFS is also requesting comments on a possible one-time, one-year renewal that could be issued under certain circumstances and if all requirements are met, as described in **Request for Public Comments** at the end of this notice. NMFS will consider public comments prior to making any final decision on the issuance of the requested MMPA authorizations and agency responses will be summarized in the final notice of our decision.

DATES: Comments and information must be received no later than [*insert date 30 days after date of publication in the FEDERAL REGISTER*].

ADDRESSES: Comments should be addressed to Jolie Harrison, Chief, Permits and Conservation Division, Office of Protected Resources, National Marine Fisheries Service. Written comments should be submitted via email to *ITP.Esch@noaa.gov*.

Instructions: NMFS is not responsible for comments sent by any other method, to any other address or individual, or received after the end of the comment period.

Comments, including all attachments, must not exceed a 25 megabyte file size. All comments received are a part of the public record and will generally be posted online at *<https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-other-energy-activities-renewable>* without change. All personal identifying information (*e.g.*, name, address) voluntarily submitted by the commenter may be publicly accessible. Do not submit confidential business information or otherwise sensitive or protected information.

FOR FURTHER INFORMATION CONTACT: Carter Esch, Office of Protected Resources, NMFS, (301) 427-8421. Electronic copies of the application and supporting documents, as well as a list of the references cited in this document, may be obtained online at: *www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act*. In case of problems accessing these documents, please call the contact listed above.

SUPPLEMENTARY INFORMATION:

Background

The MMPA prohibits the “take” of marine mammals, with certain exceptions. sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq.*) direct the Secretary of Commerce (as delegated to NMFS) to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in

a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made and either regulations are issued or, if the taking is limited to harassment, a notice of a proposed incidental take authorization may be provided to the public for review.

Authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s) and will not have an unmitigable adverse impact on the availability of the species or stock(s) for taking for subsistence uses (where relevant). Further, NMFS must prescribe the permissible methods of taking and other “means of effecting the least practicable adverse impact” on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of the species or stocks for taking for certain subsistence uses (referred to in shorthand as “mitigation”); and requirements pertaining to the mitigation, monitoring and reporting of the takings are set forth. The definitions of all applicable MMPA statutory terms cited above are included in the relevant sections below.

National Environmental Policy Act

To comply with the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 *et seq.*) and NOAA Administrative Order (NAO) 216-6A, NMFS must review our proposed action (*i.e.*, the issuance of an IHA) with respect to potential impacts on the human environment. This action is consistent with categories of activities identified in Categorical Shutdown B4 (IHAs with no anticipated serious injury or mortality) of the Companion Manual for NOAA Administrative Order 216-6A, which do not individually or cumulatively have the potential for significant impacts on the quality of the human environment and for which we have not identified any extraordinary circumstances that would preclude this categorical exclusion. Accordingly, NMFS has preliminarily determined that the issuance of the proposed IHA qualifies to be

categorically excluded from further NEPA review. NMFS will review all comments submitted in response to this notice prior to concluding our NEPA process or making a final decision on the IHA request.

Summary of Request

On December 17, 2021, NMFS received a request from Vineyard Northeast for an IHA to take marine mammals incidental to marine site characterization surveys offshore from Massachusetts to New Jersey, in the area of Commercial Lease of Submerged Lands for Renewable Energy Development on the Outer Continental Shelf Lease Areas OCS-A 0522 and OCS-A 0544 (Lease Areas) and potential offshore export cable corridor (OECC) routes to landfall locations. Following NMFS' review of the draft application, a revised version was submitted on February 15, 2022, and again on April 4, 2022. The April 4, 2022, revised version was deemed adequate and complete on April 18, 2022. Vineyard Northeast's request is for take of 19 species (with 20 managed stocks) of marine mammals, by Level B harassment only. Neither Vineyard Northeast nor NMFS expects serious injury or mortality to result from this activity and, therefore, an IHA is appropriate.

NMFS previously issued an IHA (85 FR 42357; July 14, 2020) and a renewal of that IHA (86 FR 38296; July 20, 2021) to Vineyard Wind, LLC (Vineyard Wind) for similar marine site characterization surveys. Vineyard Wind has split into several corporate entities which now include Vineyard Wind, Vineyard Wind 1, LLC (Vineyard Wind 1), and Vineyard Northeast. NMFS issued an IHA for similar surveys to Vineyard Wind 1 on July 28, 2021 (86 FR 40469). Although the surveys analyzed in this proposed IHA to Vineyard Northeast would occur in an area that overlaps with a portion of the project areas included in the previous Vineyard Wind IHA and Renewal IHA, and Vineyard Wind 1 IHA (and potentially a renewal, if appropriate), this proposed IHA

would be issued to a separate corporate entity (Vineyard Northeast). The proposed IHA would be effective June 22, 2022, through June 21, 2023.

Description of Proposed Activity

Overview

As part of its overall marine site characterization survey operations, Vineyard Northeast proposes to conduct high-resolution geophysical (HRG) surveys in the Lease Areas and along potential OECC's from northern Massachusetts to southern New Jersey. (Figure 1)

The purpose of the marine site characterization surveys is to obtain an assessment of seabed (geophysical, geotechnical, and geohazard), ecological, and archeological conditions within the footprint of planned offshore wind facility development areas. Surveys are also conducted to inform and support engineering design and to map unexploded ordnance. Underwater sound resulting from Vineyard Northeast's proposed site characterization survey activities, specifically HRG surveys, has the potential to result in incidental take of marine mammals in the form of behavioral harassment.

Dates and Duration

Vineyard Northeast anticipates that HRG survey activities would occur on approximately 869 vessel days, with an assumed daily survey distance of 80 km per vessel. This schedule is based on assumed 24-hour operations. Each day that a vessel surveys approximately 80 km within 24 hours would count as a single survey day, *e.g.*, two survey vessels operating on the same day would count as two survey days. The use of concurrently surveying vessels would facilitate completion of all 869 vessel days within one year. Vineyard Northeast proposes to begin survey activities upon receipt of an IHA and continue for up to one year (though the actual duration will likely be shorter, particularly given the use of multiple vessels). The IHA would be effective for one year from the date of issuance.

Specific Geographic Region

Vineyard Northeast's proposed HRG survey activities are planned to occur in both Federal offshore waters (including Lease Areas OCS-A 0522 and OCS-A 0544) and along potential OECCs in both Federal and State nearshore waters of Massachusetts, Rhode Island, Connecticut, New York, and New Jersey, as shown in Figure 1. The 536 square kilometer (km²) (132,370 acre) Lease Area OCS-A 0522 is located approximately 24 kilometers (km) (15 miles; mi) from the southeast corner of Martha's Vineyard, within the Massachusetts Wind Energy Area (WEA). The 174 km² (43,056 acre) Lease Area OCS-A 0544 is located approximately 38 km (24 mi) from Long Island, New York, within BOEM's Mid-Atlantic planning area. Surveys outside of the Lease Areas would extend from northern Massachusetts to southern New Jersey, including the Massachusetts/Rhode Island WEA as well as the northern portion of the Mid-Atlantic planning area. Water depths across the proposed Survey Area range from approximately 35 to 60 meters (m) (115 to 197 feet [ft]) in the Lease Areas, and from 2.5 m to > 35 m (8 to > 115 ft) along the proposed OECCs.

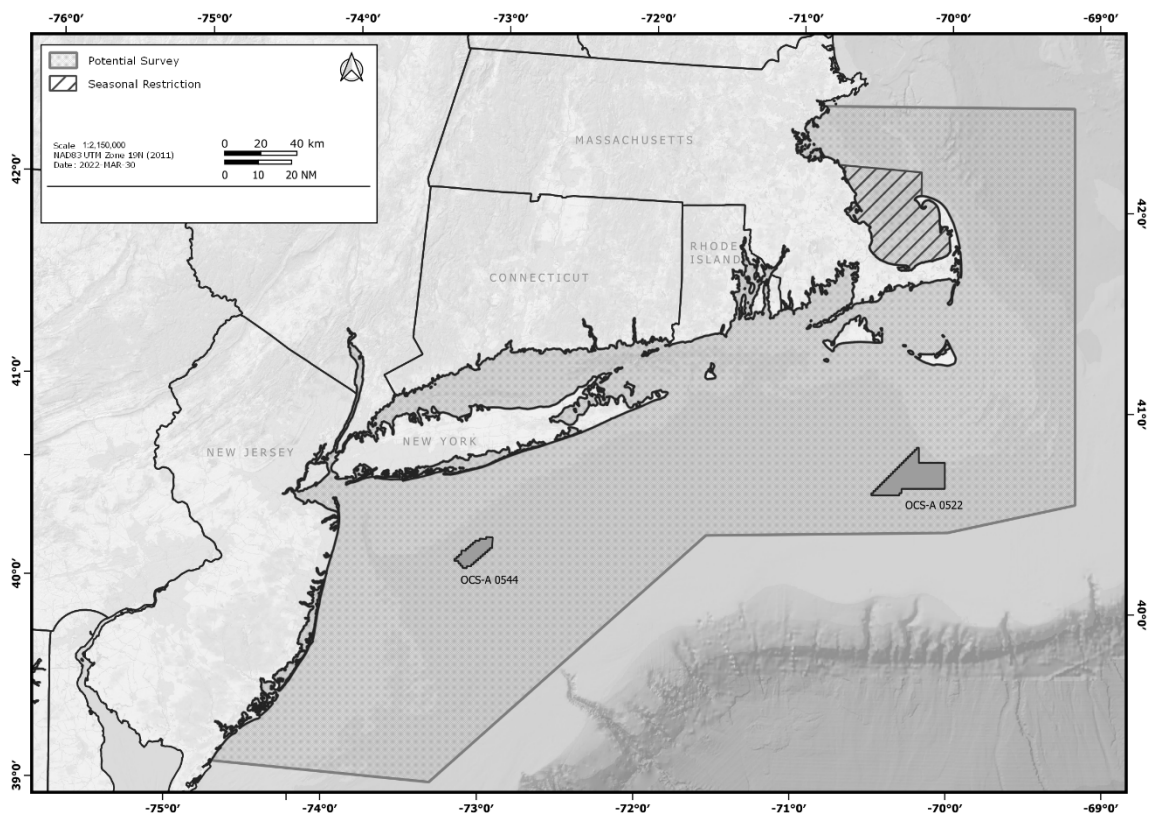


Figure 1-- Proposed Survey Area, including Lease Areas OCS-A 0522 and OCS-A 0544.

Detailed Description of Specific Activity

Vineyard Northeast proposes to conduct HRG survey operations, including single **and** multibeam depth sounding, seafloor imaging, and shallow and medium penetration sub-bottom profiling. The HRG surveys may be conducted using any or all of the following equipment types: side scan sonar, multibeam echosounder, magnetometers and gradiometers, parametric sub-bottom profiler (SBP), compressed high intensity radar pulse (CHIRP) SBP, boomers, or sparkers. Vessels would generally conduct survey effort at a transit speed of approximately 4 knots (kn; 2.1 meters per sec, m/s), which equates to 110 km per 24-hr period. However, based on past survey experience (*i.e.*, knowledge of typical daily downtime due to weather, system malfunctions, etc.), Vineyard Northeast assumes 80 km as the average distance surveyed per 24 hours. On this basis (and as mentioned previously), a total of 869 survey days are expected. However, in nearshore waters (*i.e.*, < 30 m), vessels may survey during daylight hours only, with a corresponding assumption that the daily survey distance would be halved (*i.e.*, 40 km). Approximately 35 survey days (*i.e.*, 70 12-hr survey days) are planned for nearshore (*i.e.*, < 30 m water depth) waters; surveys conducted on the remaining 834 vessel days in waters > 30 m will operate 24 hours per day.

To facilitate completion of all 869 survey days across the large Survey Area (see Figure 1) within one year, Vineyard Northeast anticipates operating multiple vessels simultaneously (*i.e.*, up to two in a Lease Area and up to two along OECC routes, including nearshore Survey Areas). The number of vessels operating at the same time may increase or decrease as the survey campaign progresses.

Acoustic sources planned for use during the proposed HRG survey activities include the following (operating frequencies are presented in hertz (Hz) and kilohertz (kHz)):

- Shallow penetration non-impulsive, non-parametric sub-bottom profilers (*i.e.*, CHIRP SBPs) are used to map the near-surface stratigraphy (top 0 to 5 m [0 to 16 feet (ft)]) of sediment below seabed). A CHIRP system emits sonar pulses that increase in frequency from about 2 to 20 kHz over time. The frequency range can be adjusted to meet project variables. Rather than being towed, these sources are typically mounted on a pole or the hull of the vessel, reducing the likelihood that an animal would be exposed to the signal.
- Medium penetration, impulsive sources (*i.e.*, boomers and sparker) are used to map deeper subsurface stratigraphy. A boomer is a broadband source operating in the 3.5 Hz to 10 kHz frequency range. Sparkers create omnidirectional acoustic pulses from 50 Hz to 4 kHz that can penetrate several hundred meters into the seafloor. These sources are typically towed behind the vessel.

Operation of the following survey equipment types is not expected to present reasonable risk of marine mammal take, and will not be discussed further beyond the brief summaries provided below.

- Non-impulsive, parametric SBPs are used for providing high density data in sub-bottom profiles that are typically required for cable routes, very shallow water, and archaeological surveys. These sources generate short, very narrow-beam (1° to 3.5°) signals at high frequencies (generally around 85-100 kHz). The narrow beamwidth significantly reduces the potential that a marine mammal could be exposed to the signal, while the high frequency of operation means that the signal is rapidly attenuated in seawater. These sources are typically mounted on the hull of the vessel or deployed from a side pole rather than towed behind the vessel.

- Ultra-short baseline (USBL) positioning systems are used to provide high accuracy ranges by measuring the time between the acoustic pulses transmitted by the vessel transceiver and a transponder (or beacon) necessary to produce the acoustic profile. It is a two-component system with a pole-mounted transceiver and one or several transponders mounted on other survey equipment. USBLs are expected to produce extremely small acoustic propagation distances in their typical operating configuration.
- Single and Multibeam echosounders (MBESs) are used to determine water depths and general bottom topography. The proposed MBESs all have operating frequencies > 180 kHz and are therefore outside the general hearing range of marine mammals.
- Side scan sonar (SSS) is used for seabed sediment classification purposes and to identify natural and man-made acoustic targets on the seafloor. The proposed SSSs all have operating frequencies > 180 kHz and are therefore outside the general hearing range of marine mammals.

Table 1 identifies all representative proposed survey equipment that has the potential to result in harassment of marine mammals (*i.e.*, expected to operate at or below 180 kHz). The make and model of the listed geophysical equipment may vary depending on availability and the final equipment choices will vary depending upon the final survey design, vessel availability, and survey contractor selection. Please see Table A-3 in Appendix A of the IHA application for specifications on all active acoustic equipment with the potential for use during Vineyard Northeast's site characterization surveys.

Table 1 — Summary of Representative HRG Equipment¹

System	Frequency (kHz)	Beam width (°)	Pulse duration (ms)	Repetition rate (Hz)	In-beam Source Level (dB)	
					RMS	Pk
Shallow subbottom profiler (non-impulsive)						
EdgeTech Chirp 216	2–16	65	2	3.75	178	182
Deep seismic profiler (impulsive)						
Applied Acoustics AA251 Boomer	0.2–15	180	0.8	2	205	212
GeoMarine Geo Spark 2000 (400 tip)	0.05–3	180	3.4	1	203	213

¹ – Edge Tech Chirp 512i used as proxy source for Edge Tech 216, as Chirp 512i has similar operation settings as Chirp 216. SIG ELC 820 Sparker used as proxy for GeoMarine Geo Spark 2000 (400 tip), as SIG ELC 820 has similar operation settings as Geo Spark 2000. See Crocker and Fratantonio (2016) and Table A-3 in Appendix A of Vineyard Northeast’s application for more information.

Proposed mitigation, monitoring, and reporting measures are described in detail later in this document (please see **Proposed Mitigation** and **Proposed Monitoring and Reporting**).

Description of Marine Mammals in the Area of Specified Activities

Sections 3 and 4 of Vineyard Northeast’s application summarize available information regarding status and trends, distribution and habitat preferences, and behavior and life history, of the potentially affected species. Additional information regarding population trends and threats may be found in NMFS’ Stock Assessment Reports (SARs; <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments>) and more general information about these species (*e.g.*, physical and behavioral descriptions) may be found on NMFS’ website (<https://www.fisheries.noaa.gov/find-species>).

Table 2 lists all species or stocks for which take is expected and proposed to be authorized for this action, and summarizes information related to the population or stock, including regulatory status under the MMPA and Endangered Species Act (ESA) and potential biological removal (PBR), where known. For taxonomy, NMFS follows Committee on Taxonomy (2021). PBR is defined by the MMPA as the maximum number

of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population (as described in NMFS' SARs). While no mortality is anticipated or authorized here, PBR, and annual serious injury and mortality from anthropogenic sources are included here as gross indicators of the status of the species and other threats.

Marine mammal abundance estimates presented in this document represent the total number of individuals that make up a given stock or the total number estimated within a particular study or survey area. NMFS' stock abundance estimates for most species represents the total estimate of individuals within the geographic area, if known, that comprises that stock. For some species, this geographic area may extend beyond U.S. waters. All managed stocks in this region are assessed in NMFS' U.S. Atlantic and Gulf of Mexico Stock Assessment (SARs). All values presented in Table 2 are the most recent available at the time of publication and are available in the Draft 2021 SARs (*Hayes et al.*, 2021), available at: <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports>).

Table 2 — Marine Mammals Likely To Occur in the Project Area That May Be Affected by Vineyard Northeast's Proposed Activity

Common Name	Scientific Name	Stock	ESA/MMPA status; strategic (Y/N) ¹	Stock abundance (CV, N _{min} , most recent abundance survey) ²	PBR	Annual M/SI ³
Order Cetartiodactyla—Cetacea—Superfamily Mysticeti (baleen whales)						
Blue whale ⁴	<i>Balaenoptera musculus</i>	Western North Atlantic	E/D, Y	402 (unk, 402; 2008)	0.8	0
North Atlantic right whale	<i>Eubalaena glacialis</i>	Western North Atlantic	E/D, Y	368 (0; 364; 2019)	0.7	7.7
Humpback whale	<i>Megaptera novaeangliae</i>	Gulf of Maine	-/-; Y	1,396 (0; 1,380; 2016)	22	12.15
Fin whale	<i>Balaenoptera physalus</i>	Western North Atlantic	E/D, Y	6,802 (0.24; 5,573; 2016)	11	1.8
Sei whale	<i>Balaenoptera borealis</i>	Nova Scotia	E/D, Y	6,292 (1.02; 3,098; 2016)	6.2	0.8
Minke whale	<i>Balaenoptera acutorostrata</i>	Canadian Eastern Coastal	-/-, N	21,968 (0.31; 17,002; 2016)	170	10.6

Superfamily Odontoceti (toothed whales, dolphins, and porpoises)						
Sperm whale	<i>Physeter macrocephalus</i>	North Atlantic	E/D, Y	4,349 (0.28; 3,451; 2016)	3.9	0
Long-finned pilot whale	<i>Globicephala melas</i>	Western North Atlantic	-/-, N	39,215 (0.3; 30,627; 2016)	306	29
Orca (killer whale) ⁴	<i>Orcinus Orca</i>	Western North Atlantic	-/-, N	unk (unk; unk; 2016)	unk	0
False killer whale ⁴	<i>Pseudorca crassidens</i>	Western North Atlantic	-/-, N	1,791 (0.56; 1,154; 2016)	12	0
Atlantic spotted dolphin	<i>Stenella frontalis</i>	Western North Atlantic	-/-, N	39,921 (0.27; 32,032; 2016)	320	0
Atlantic white-sided dolphin	<i>Lagenorhynchus acutus</i>	Western North Atlantic	-/-, N	93,233 (0.71; 54,443; 2016)	544	227
Bottlenose dolphin	<i>Tursiops truncatus</i>	Western North Atlantic Northern Migratory Coastal	-/D, Y	6,639 (0.41; 4,759; 2016)	48	12.2 - 21.5
		Western North Atlantic Offshore	-/-, N	62,851 (0.23; 51,914; 2016)	519	28
Common dolphin	<i>Delphinus delphis</i>	Western North Atlantic	-/-, N	172,974 (0.21, 145,216, 2016)	1,452	390
Risso's dolphin	<i>Grampus griseus</i>	Western North Atlantic	-/-, N	35,215 (0.19; 30,051; 2016)	301	34
White-beaked dolphin ⁴	<i>Lagenorhynchus albirostris</i>	Western North Atlantic	-/-, N	536,016 (0.31; 415,344; 2016)	4,153	0
Harbor porpoise	<i>Phocoena phocoena</i>	Gulf of Maine/Bay of Fundy	-/-, N	95,543 (0.31; 74,034; 2016)	851	164
Order Carnivora—Superfamily Pinnipedia						
Harbor seal	<i>Phoca vitulina</i>	Western North Atlantic	-/-, N	61,336 (0.08; 57,637; 2018)	1,729	339
Gray seal ⁵	<i>Halichoerus grypus</i>	Western North Atlantic	-/-, N	27,300 (0.22; 22,785; 2016)	1,389	4,453

¹ - ESA status: Endangered (E), Threatened (T)/MMPA status: Depleted (D). A dash (-) indicates that the species is not listed under the ESA or designated as depleted under the MMPA. Under the MMPA, a strategic stock is one for which the level of direct human-caused mortality exceeds PBR or which is determined to be declining and likely to be listed under the ESA within the foreseeable future. Any species or stock listed under the ESA is automatically designated under the MMPA as depleted and as a strategic stock.

² - NMFS marine mammal stock assessment reports online at: www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments. CV is the coefficient of variation; N_{min} is the minimum estimate of stock abundance. In some cases, CV is not applicable.

³ - These values, found in NMFS' SARs, represent annual levels of human-caused mortality plus serious injury from all sources combined (e.g., commercial fisheries, ship strike).

⁴ - Rare (or not likely to occur) species

⁵ - NMFS' gray seal stock abundance estimate (and associated PBR value) applies to U.S. population only. Total stock abundance (including animals in Canada) is approximately 451,431. The annual mortality and serious injury (M/SI) value given is for the total stock.

Table 2 includes 15 species (with 16 managed stocks) that temporally and spatially co-occur with the activity to the degree that take is reasonably likely to occur. Vineyard Northeast is also requesting take of four species that are considered rare (or not likely to occur) in the Survey Area (*i.e.*, blue whale, killer whale, false killer whale, and white-beaked dolphin), based on recent detections (acoustic and/or visual) of those species in the Survey Area. In total, Vineyard Northeast is requesting take of 19 species (with 20 managed stocks). In addition to what is included in Sections 3 and 4 of the application, the SARS, and NMFS' website, further detail informing the baseline for select species (*i.e.*, information regarding current Unusual Mortality Events (UME) and important habitat areas) is provided below.

North Atlantic Right Whale

The North Atlantic right whale is considered one of the most critically endangered populations of large whales in the world and has been listed as a Federal endangered species since 1970. The Western Atlantic stock is considered depleted under the MMPA (Hayes *et al.* 2021). There is a recovery plan (NOAA Fisheries 2017) for the North Atlantic right whale, and relatively recently there was a five-year review of the species (NOAA Fisheries 2017). The North Atlantic right whale had only a 2.8 percent recovery rate between 1990 and 2011 (Hayes *et al.* 2021).

Elevated North Atlantic right whale mortalities have occurred since June 7, 2017, along the U.S. and Canadian coast with the leading category for the cause of death for this UME determined to be "human interaction," specifically from entanglements or vessel strikes. As of May X, 2022, a total of 34 confirmed dead stranded whales (21 in Canada; 13 in the United States) have been documented. The cumulative total number of animals in the North Atlantic right whale UME has been updated to 50 individuals to include both the confirmed mortalities (dead stranded or floaters) (n=34) and seriously injured free-swimming whales (n=16) to better reflect the confirmed number of whales

likely removed from the population during the UME, and more accurately reflect the population impacts. More information about this UME is available online at: www.fisheries.noaa.gov/national/marine-life-distress/2017-2021-north-atlantic-right-whale-unusual-mortality-event.

NMFS' regulations at 50 CFR part 224.105 designated nearshore waters of the Mid-Atlantic Bight as Mid-Atlantic U.S. Seasonal Management Areas (SMAs) for North Atlantic right whales in 2008. SMAs were developed to reduce the threat of collisions between ships and North Atlantic right whales around their migratory route and calving grounds. The Survey Area overlaps with the Cape Cod Bay (active between January 1 and May 15), Off Race Point (active between March 1 and April 30), Great South Channel (active between April 1 and July 31), and Mid-Atlantic Migratory (active between November 1 and April 30) SMAs.

The proposed Survey Area also partially overlaps with previously identified North Atlantic right whale feeding Biologically Important Areas (BIAs) and part of the migratory corridor BIA for North Atlantic right whales (March-April and November-December) that extends from the coast to the continental shelf break, and from Massachusetts to Florida (LeBrecque *et al.*, 2015). A map showing designated BIAs is available at: <https://cetsound.noaa.gov/biologically-important-area-map>. In addition to currently designated feeding BIAs, Oleson *et al.* (2020) identified the area south of Martha's Vineyard and Nantucket, referred to as "South of the Islands," as a newer, year-round, core North Atlantic right whale foraging habitat. The South of the Islands area is also within the bounds of Vineyard Northeast's Survey Area.

Humpback Whale

NMFS recently evaluated the status of the species, and on September 8, 2016, NMFS divided the species into 14 distinct population segments (DPS), removed the species-level listing, and in its place listed four DPSs as endangered and one DPS as

threatened (81 FR 62260; September 8, 2016). The remaining nine DPSs were not listed. The West Indies DPS, which is not listed under the ESA, is the only DPS of humpback whale that is expected to occur in the Survey Area. Bettridge *et al.* (2015) estimated the size of this population at 12,312 (95 percent CI 8,688-15,954) whales in 2004-05, which is consistent with previous population estimates of approximately 10,000-11,000 whales (Stevick *et al.*, 2003; Smith *et al.*, 1999) and the increasing trend for the West Indies DPS (Bettridge *et al.*, 2015). Whales occurring in the Survey Area are considered to be from the West Indies DPS but are not necessarily from the Gulf of Maine feeding population managed as a stock by NMFS. Barco *et al.*, 2002 estimated that, based on photo-identification, only 39 percent of individual humpback whales observed along the mid- and south Atlantic U.S. coast are from the Gulf of Maine stock.

Since January 2016, elevated humpback whale mortalities have occurred along the Atlantic coast from Maine to Florida. Partial or full necropsy examinations have been conducted on approximately half of the 156 known cases (as of May X, 2022). Of the whales examined, about 50 percent had evidence of human interaction, either ship strike or entanglement. While a portion of the whales have shown evidence of pre-mortem vessel strike, this finding is not consistent across all whales examined and more research is needed. NOAA is consulting with researchers that are conducting studies on the humpback whale populations, and these efforts may provide information on changes in whale distribution and habitat use that could provide additional insight into how these vessel interactions occurred. More information is available at:

www.fisheries.noaa.gov/national/marine-life-distress/2016-2021-humpback-whale-unusual-mortality-event-along-atlantic-coast.

The northern and most eastern portions of the proposed Survey Area partially overlap with the humpback whale feeding BIA (March through December), which

extends throughout the Gulf of Maine, Stellwagen Bank, and Great South Channel (LeBrecque *et al.*, 2015).

Minke Whale

Since January 2017, elevated minke whale mortalities have occurred along the Atlantic coast from Maine through South Carolina, with a total of 122 strandings (as of May X, 2022). This event has been declared a UME. Full or partial necropsy examinations were conducted on more than 60 percent of the whales. Preliminary findings in several of the whales have shown evidence of human interactions or infectious disease, but these findings are not consistent across all of the whales examined, so more research is needed. More information is available at:

www.fisheries.noaa.gov/national/marine-life-distress/2017-2021-minke-whale-unusual-mortality-event-along-atlantic-coast.

The northern and most eastern portions of the proposed Survey Area partially overlap with one of the minke whale feeding BIAs (March through November), which includes the southern and southwestern section of the Gulf of Maine, including Georges Bank, the Great South Channel, Cape Cod Bay and Massachusetts Bay, Stellwagen Bank, Cape Anne, and Jeffreys Ledge (LeBrecque *et al.*, 2015).

Seals

Since July 2018, elevated numbers of harbor seal and gray seal mortalities have occurred across Maine, New Hampshire and Massachusetts. This event has been declared a UME. Additionally, stranded seals have shown clinical signs as far south as Virginia, although not in elevated numbers; therefore, the UME investigation now encompasses all seal strandings from Maine to Virginia. Ice seals (harp and hooded seals) have also been stranding with clinical signs, again not in elevated numbers, and those two seal species have also been added to the UME investigation. A total of 3,152 reported strandings (of all species) had occurred from July 1, 2018, through March 13, 2020. Full or partial

necropsy examinations have been conducted on some of the seals and samples have been collected for testing. Based on tests conducted thus far, the main pathogen found in the seals is phocine distemper virus. NMFS is performing additional testing to identify any other factors that may be involved in this UME. Closure of this UME is pending.

Information on this UME is available online at: www.fisheries.noaa.gov/new-england-mid-atlantic/marine-life-distress/2018-2020-pinniped-unusual-mortality-event-along.

Marine Mammal Hearing

Hearing is the most important sensory modality for marine mammals underwater, and exposure to anthropogenic sound can have deleterious effects. To appropriately assess the potential effects of exposure to sound, it is necessary to understand the frequency ranges marine mammals are able to hear. Current data indicate that not all marine mammal species have equal hearing capabilities (*e.g.*, Richardson *et al.*, 1995; Wartzok and Ketten, 1999; Au and Hastings, 2008). To reflect this, Southall *et al.* (2007) recommended that marine mammals be divided into functional hearing groups based on directly measured or estimated hearing ranges on the basis of available behavioral response data, audiograms derived using auditory evoked potential techniques, anatomical modeling, and other data. Note that no direct measurements of hearing ability have been successfully completed for mysticetes (*i.e.*, low-frequency cetaceans). Subsequently, NMFS (2018) described generalized hearing ranges for these marine mammal hearing groups. Generalized hearing ranges were chosen based on the approximately 65 decibel (dB) threshold from the normalized composite audiograms, with the exception for lower limits for low-frequency cetaceans where the lower bound was deemed to be biologically implausible and the lower bound from Southall *et al.* (2007) retained. Marine mammal hearing groups and their associated hearing ranges are provided in Table 3.

Table 3 -- Marine Mammal Hearing Groups (NMFS, 2018).

Hearing Group	Generalized Hearing Range*
Low-frequency (LF) cetaceans (baleen whales)	7 Hz to 35 kHz
Mid-frequency (MF) cetaceans (dolphins, toothed whales, beaked whales, bottlenose whales)	150 Hz to 160 kHz
High-frequency (HF) cetaceans (true porpoises, <i>Kogia</i> , river dolphins, <i>cephalorhynchid</i> , <i>Lagenorhynchus cruciger</i> & <i>L. australis</i>)	275 Hz to 160 kHz
Phocid pinnipeds (PW) (underwater) (true seals)	50 Hz to 86 kHz

*Represents the generalized hearing range for the entire group as a composite (*i.e.*, all species within the group), where individual species' hearing ranges are typically not as broad. Generalized hearing range chosen based on ~65 dB threshold from normalized composite audiogram, with the exception for lower limits for LF cetaceans (Southall *et al.*, 2007) and PW pinniped (approximation).

The pinniped functional hearing group was modified from Southall *et al.* (2007) on the basis of data indicating that phocid species have consistently demonstrated an extended frequency range of hearing compared to otariids, especially in the higher frequency range (Hemilä *et al.*, 2006; Kastelein *et al.*, 2009; Reichmuth, 2013).

For more detail concerning these groups and associated frequency ranges, please see NMFS (2018) for a review of available information. Fifteen species of marine mammal species (13 cetacean and 2 pinniped (both phocid) species) have the reasonable potential to co-occur with the proposed survey activities and four rare, or not likely to occur, species (all cetacean) may be encountered during the proposed survey activities. Please refer back to Table 2. Of the cetacean species that may be present, six are classified as low-frequency cetaceans (*i.e.*, all mysticete species), ten are classified as mid-frequency cetaceans (*i.e.*, all delphinid species and the sperm whale), and one is classified as a high-frequency cetacean (*i.e.*, harbor porpoise).

Potential Effects of Specified Activities on Marine Mammals and their Habitat

This section includes a summary and discussion of the ways that components of the specified activity may impact marine mammals and their habitat. Detailed descriptions of the potential effects of similar specified activities have been provided in other **Federal Register** notices, including for survey activities using the same

methodology, over a similar amount of time, and occurring within the same specified geographical region (*e.g.*, 85 FR 21198, April 16, 2020; 85 FR 42357, July 14, 2020; 85 FR 63508, October 8, 2020; 85 FR 71058, November 6, 2020; 86 FR 21289, April 22, 2021; 86 FR 38296, July 20, 2021; 86 FR 40469, July 28, 2021; 87 FR 13975, March 11, 2022; 87 FR 24103, April 22, 2022). No significant new information is available, and we refer the reader to these documents rather than repeating the details here.

The **Estimated Take** section includes a quantitative analysis of the number of individuals that are expected to be taken by Vineyard Northeast's activities. The **Negligible Impact Analysis and Determination** section considers the potential effects of the specified activity, the **Estimated Take** section, and the **Proposed Mitigation** section, to draw conclusions regarding the likely impacts of these activities on the reproductive success or survivorship of individuals and how those impacts on individuals are likely to impact marine mammal species or stocks.

Background on Active Acoustic Sound Sources and Acoustic Terminology

This subsection contains a brief technical background on sound, on the characteristics of certain sound types, and on metrics used in this proposal inasmuch as the information is relevant to the specified activity and to the summary of the potential effects of the specified activity on marine mammals. For general information on sound and its interaction with the marine environment, please see, *e.g.*, Au and Hastings (2008); Richardson *et al.*, (1995); Urick (1983).

Sound travels in waves, the basic components of which are frequency, wavelength, velocity, and amplitude. Frequency is the number of pressure waves that pass by a reference point per unit of time and is measured in hertz or cycles per second. Wavelength is the distance between two peaks or corresponding points of a sound wave (length of one cycle). Higher frequency sounds have shorter wavelengths than lower frequency sounds, and typically attenuate (decrease) more rapidly, except in certain cases

in shallower water. Amplitude is the height of the sound pressure wave or the “loudness” of a sound and is typically described using the relative unit of the decibel. A sound pressure level (SPL) in dB is described as the ratio between a measured pressure and a reference pressure (for underwater sound, this is 1 microPascal (μPa)), and is a logarithmic unit that accounts for large variations in amplitude. Therefore, a relatively small change in dB corresponds to large changes in sound pressure. The source level (SL) represents the SPL referenced at a distance of 1-m from the source (referenced to 1 μPa), while the received level is the SPL at the listener’s position (referenced to 1 μPa).

Root mean square (rms) is the quadratic mean sound pressure over the duration of an impulse. Root mean square is calculated by squaring all of the sound amplitudes, averaging the squares, and then taking the square root of the average (Urick, 1983). Root mean square accounts for both positive and negative values; squaring the pressures makes all values positive so that they may be accounted for in the summation of pressure levels (Hastings and Popper, 2005). This measurement is often used in the context of discussing behavioral effects, in part because behavioral effects, which often result from auditory cues, may be better expressed through averaged units than by peak pressures.

Sound exposure level (SEL; represented as dB re 1 $\mu\text{Pa}^2\text{-s}$) represents the total energy in a stated frequency band over a stated time interval or event and considers both intensity and duration of exposure. The per-pulse SEL is calculated over the time window containing the entire pulse (*i.e.*, 100 percent of the acoustic energy). SEL is a cumulative metric; it can be accumulated over a single pulse or calculated over periods containing multiple pulses. Cumulative SEL represents the total energy accumulated by a receiver over a defined time window or during an event. Peak sound pressure (also referred to as zero-to-peak sound pressure or 0-pk) is the maximum instantaneous sound pressure measurable in the water at a specified distance from the source and is represented in the same units as the rms sound pressure.

When underwater objects vibrate or activity occurs, sound-pressure waves are created. These waves alternately compress and decompress the water as the sound wave travels. Underwater sound waves radiate in a manner like ripples on the surface of a pond and may be directed either in a beam or in beams or may radiate in all directions (omnidirectional sources). The compressions and decompressions associated with sound waves are detected as changes in pressure by aquatic life and man-made sound receptors such as hydrophones.

Even in the absence of sound from the specified activity, the underwater environment is typically loud due to ambient sound, which is defined as environmental background sound levels lacking a single source or point (Richardson *et al.*, 1995). The sound level of a region is defined by the total acoustical energy being generated by known and unknown sources. These sources may include physical (*e.g.*, wind and waves, earthquakes, ice, atmospheric sound), biological (*e.g.*, sounds produced by marine mammals, fish, and invertebrates), and anthropogenic (*e.g.*, vessels, dredging, construction) sound. Several sources contribute to ambient sound, including wind and waves, which are a main source of naturally occurring ambient sound for frequencies between 200 Hz and 50 kHz (Mitson, 1995). In general, ambient sound levels tend to increase with increasing wind speed and wave height. Precipitation can become an important component of total sound at frequencies above 500 Hz, and possibly down to 100 Hz during quiet times. Marine mammals can contribute significantly to ambient sound levels, as can some fish and snapping shrimp. The frequency band for biological contributions is from approximately 12 Hz to over 100 kHz. Sources of ambient sound related to human activity include transportation (surface vessels), dredging and construction, oil and gas drilling and production, geophysical surveys, sonar, and explosions. Vessel noise typically dominates the total ambient sound for frequencies

between 20 and 300 Hz. In general, the frequencies of anthropogenic sounds are below 1 kHz and, if higher frequency sound levels are created, they attenuate rapidly.

The sum of the various natural and anthropogenic sound sources that comprise ambient sound at any given location and time depends not only on the source levels (as determined by current weather conditions and levels of biological and human activity) but on the ability of sound to propagate through the environment. In turn, sound propagation is dependent on the spatially and temporally varying properties of the water column and sea floor and is frequency dependent. As a result of the dependence on many varying factors, ambient sound levels can be expected to vary widely over both coarse and fine spatial and temporal scales. Sound levels at a given frequency and location can vary by 10-20 dB from day to day (Richardson *et al.*, 1995). The result is that, depending on the source type and its intensity, sound from the specified activity may be a negligible addition to the local environment or could form a distinctive signal that may affect marine mammals. Details of source types are described in the following text.

Sounds are often considered to fall into one of two general types: pulsed and non-pulsed (defined in the following). The distinction between these two sound types is important because they have differing potential to cause physical effects, particularly regarding hearing (*e.g.*, Ward, 1997 in Southall *et al.*, 2007). Please see Southall *et al.*, (2007) for an in-depth discussion of these concepts. The distinction between these two sound types is not always obvious, as certain signals share properties of both pulsed and non-pulsed sounds. A signal near a source could be categorized as a pulse, but due to propagation effects as it moves farther from the source, the signal duration becomes longer (*e.g.*, Greene and Richardson, 1988).

Pulsed sound sources (*e.g.*, airguns, explosions, gunshots, sonic booms, impact pile driving) produce signals that are brief (typically considered to be less than one second), broadband, atonal transients (ANSI, 1986, 2005; Harris, 1998; NIOSH, 1998)

and occur either as isolated events or repeated in some succession. Pulsed sounds are all characterized by a relatively rapid rise from ambient pressure to a maximal pressure value followed by a rapid decay period that may include a period of diminishing, oscillating maximal and minimal pressures, and generally have an increased capacity to induce physical injury as compared with sounds that lack these features.

Non-pulsed sounds can be tonal, narrowband, or broadband, brief or prolonged, and may be either continuous or intermittent (ANSI, 1995; NIOSH, 1998). Some of these non-pulsed sounds can be transient signals of short duration but without the essential properties of pulses (*e.g.*, rapid rise time). Examples of non-pulsed sounds include those produced by vessels, aircraft, machinery operations such as drilling or dredging, vibratory pile driving, and active sonar systems. The duration of such sounds, as received at a distance, can be greatly extended in a highly reverberant environment.

Sparkers and boomers produce pulsed signals with energy in the frequency ranges specified in Table 1. The amplitude of the acoustic wave emitted from sparker sources is equal in all directions (*i.e.*, omnidirectional), while other sources planned for use during the proposed surveys have some degree of directionality to the beam, as specified in Table 1. Finally, CHIRP SBPs should be considered non-impulsive, intermittent sources.

Summary on Specific Potential Effects of Acoustic Sound Sources

Underwater sound from active acoustic sources can include one or more of the following: temporary or permanent hearing impairment, behavioral disturbance, masking, stress, and non-auditory physical effects. The degree of effect is intrinsically related to the signal characteristics, received level, distance from the source, and duration of the sound exposure. Marine mammals exposed to high-intensity sound, or to lower-intensity sound for prolonged periods, can experience hearing threshold shift (TS), which is the loss of hearing sensitivity at certain frequency ranges (Finneran, 2015). TS can be permanent (PTS; permanent threshold shift), in which case the loss of hearing sensitivity

is not fully recoverable, or temporary (TTS; temporary threshold shift), in which case the animal's hearing threshold would recover over time (Southall *et al.*, 2007).

Animals in the vicinity of Vineyard Northeast's proposed HRG survey activity are unlikely to incur even TTS due to the characteristics of the sound sources, which include relatively low source levels (178 to 205 dB re 1 μ Pa m), and generally very short pulses and potential duration of exposure. These characteristics mean that instantaneous exposure is unlikely to cause TTS, as it is unlikely that exposure would occur close enough to the vessel for received levels to exceed peak pressure TTS criteria, and that the cumulative duration of exposure would be insufficient to exceed cumulative sound exposure level (SEL) criteria. Even for high-frequency cetacean species (*e.g.*, harbor porpoises), which have the greatest sensitivity to potential TTS, individuals would have to make a very close approach and also remain very close to vessels operating these sources in order to receive multiple exposures at relatively high levels, as would be necessary to cause TTS. Intermittent exposures—as would occur due to the brief, transient signals produced by these sources—require a higher cumulative SEL to induce TTS than would continuous exposures of the same duration (*i.e.*, intermittent exposure results in lower levels of TTS). Moreover, most marine mammals would more likely avoid a loud sound source rather than swim in such close proximity as to result in TTS. Kremser *et al.*, (2005) noted that the probability of a cetacean swimming through the area of exposure when a sub-bottom profiler emits a pulse is small—because if the animal was in the area, it would have to pass the transducer at close range in order to be subjected to sound levels that could cause TTS and would likely exhibit avoidance behavior to the area near the transducer rather than swim through at such a close range. Further, the restricted beam shape of the Edge Tech 216 Chirp planned for use (Table 1) makes it unlikely that an animal would be exposed more than briefly during the passage of the vessel.

Behavioral disturbance may include a variety of effects, including subtle changes in behavior (*e.g.*, minor or brief avoidance of an area or changes in vocalizations), more conspicuous changes in similar behavioral activities, and more sustained and/or potentially severe reactions, such as displacement from or abandonment of high-quality habitat. Behavioral responses to sound are highly variable and context-specific and any reactions depend on numerous intrinsic and extrinsic factors (*e.g.*, species, state of maturity, experience, current activity, reproductive state, auditory sensitivity, time of day), as well as the interplay between factors. Available studies show wide variation in response to underwater sound; therefore, it is difficult to predict specifically how any given sound in a particular instance might affect marine mammals perceiving the signal.

In addition, sound can disrupt behavior through masking, or interfering with, an animal's ability to detect, recognize, or discriminate between acoustic signals of interest (*e.g.*, those used for intraspecific communication and social interactions, prey detection, predator avoidance, navigation). Masking occurs when the receipt of a sound is interfered with by another coincident sound at similar frequencies and at similar or higher intensity and may occur whether the sound is natural (*e.g.*, snapping shrimp, wind, waves, precipitation) or anthropogenic (*e.g.*, shipping, sonar, seismic exploration) in origin. Marine mammal communications would not likely be masked appreciably by the acoustic signals given the directionality of the signals for most HRG survey equipment types planned for use (Table 1) and the brief period when an individual mammal is likely to be exposed.

Sound may affect marine mammals through impacts on the abundance, behavior, or distribution of prey species (*e.g.*, crustaceans, cephalopods, fish, and zooplankton) (*i.e.*, effects to marine mammal habitat). Prey species exposed to sound might move away from the sound source, experience TTS, experience masking of biologically relevant sounds, or show no obvious direct effects. The most likely impacts (if any) for most prey

species in a given area would be temporary avoidance of the area. Surveys using active acoustic sound sources move through an area, limiting exposure to multiple pulses. In all cases, sound levels would return to ambient once a survey ends and the noise source is shut down and, when exposure to sound ends, behavioral and/or physiological responses are expected to end relatively quickly. Finally, the HRG survey equipment will not have significant impacts to the seafloor and does not represent a source of pollution.

Vessel Strike

Vessel collisions with marine mammals, or ship strikes, can result in death or serious injury of the animal. These interactions are typically associated with large whales, which are less maneuverable than are smaller cetaceans or pinnipeds in relation to large vessels. Ship strikes generally involve commercial shipping vessels, which are normally larger and of which there is much more traffic in the ocean than geophysical survey vessels. Jensen and Silber (2004) summarized ship strikes of large whales worldwide from 1975-2003 and found that most collisions occurred in the open ocean and involved large vessels (*e.g.*, commercial shipping). For vessels used in geophysical survey activities, vessel speed while towing gear is typically only 4-5 knots. At these speeds, both the possibility of striking a marine mammal and the possibility of a strike resulting in serious injury or mortality are so low as to be discountable. At average transit speed for geophysical survey vessels, the probability of serious injury or mortality resulting from a strike is less than 50 percent. However, the likelihood of a strike actually happening is again low given the smaller size of these vessels and generally slower speeds. Notably in the Jensen and Silber study, no strike incidents were reported for geophysical survey vessels during that time period.

The potential effects of Vineyard Northeast's specified survey activity are expected to be limited to Level B behavioral harassment. No permanent or temporary

auditory effects, or significant impacts to marine mammal habitat, including prey, are expected.

Estimated Take

This section provides an estimate of the number of incidental takes proposed for authorization through this IHA, which will inform both NMFS' consideration of "small numbers" and the negligible impact determination.

Harassment is the only type of take expected to result from these activities. Except with respect to certain activities not pertinent here, section 3(18) of the MMPA defines "harassment" as any act of pursuit, torment, or annoyance, which (i) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B harassment).

Authorized takes would be by Level B harassment only, in the form of disruption of behavioral patterns for individual marine mammals resulting from exposure to noise from certain HRG acoustic sources. Based primarily on the characteristics of the signals produced by the acoustic sources planned for use, Level A harassment is neither anticipated (even absent mitigation), nor proposed to be authorized. Consideration of the anticipated effectiveness of the mitigation measures (*i.e.*, pre-start clearance and shutdown measures), discussed in detail below in the **Proposed Mitigation** section, further strengthens the conclusion that Level A harassment is not a reasonably expected outcome of the survey activity. As previously described, no serious injury or mortality is anticipated or proposed to be authorized for this activity. Below we describe how take is estimated.

Generally speaking, we estimate take by considering: (1) acoustic thresholds above which NMFS believes the best available science indicates marine mammals will be

behaviorally harassed or incur some degree of permanent hearing impairment; (2) the area or volume of water that will be ensonified above these levels in a day; (3) the density or occurrence of marine mammals within these ensonified areas; and, (4) and the number of days of activities. We note that while these basic factors can contribute to a basic calculation to provide an initial prediction of takes, additional information that can qualitatively inform take estimates is also sometimes available (*e.g.*, previous monitoring results or average group size). Below, we describe the factors considered here in more detail and present the proposed take estimates.

Acoustic Thresholds

NMFS uses acoustic thresholds that identify the received level of underwater sound above which exposed marine mammals would be reasonably expected to be behaviorally harassed (equated to Level B harassment) or to incur PTS of some degree (equated to Level A harassment).

Level B Harassment – Though significantly driven by received level, the onset of behavioral disturbance from anthropogenic noise exposure is also informed to varying degrees by other factors related to the source (*e.g.*, frequency, predictability, duty cycle), the environment (*e.g.*, bathymetry), and the receiving animals (hearing, motivation, experience, demography, behavioral context) and can be difficult to predict (Southall *et al.*, 2007, Ellison *et al.*, 2012). Based on what the available science indicates and the practical need to use a threshold based on a factor that is both predictable and measurable for most activities, NMFS uses a generalized acoustic threshold based on received level to estimate the onset of behavioral harassment. NMFS predicts that marine mammals may be behaviorally harassed (*i.e.*, Level B harassment) when exposed to underwater anthropogenic noise above received levels of 160 dB re 1 μ Pa (rms) for impulsive sources (*i.e.*, boomers, sparkers) and non-impulsive, intermittent sources (*e.g.*, CHIRP SBPs) evaluated here for Vineyard Northeast’s proposed activity.

Level A harassment - NMFS' Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0) (Technical Guidance, 2018) identifies dual criteria to assess auditory injury (Level A harassment) to five different marine mammal groups (based on hearing sensitivity) as a result of exposure to noise from two different types of sources (impulsive or non-impulsive). For more information, see NMFS' 2018 Technical Guidance, which may be accessed at: <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-guidance>.

Vineyard Northeast's proposed activity includes the use of impulsive (*i.e.*, boomers and sparkers) and non-impulsive (*e.g.*, CHIRP SBPs) sources. However, as discussed above, NMFS has concluded that Level A harassment is not a reasonably likely outcome for marine mammals exposed to noise from the sources proposed for use here, and the potential for Level A harassment is not evaluated further in this document. Please see Vineyard Northeast's application for a quantitative Level A exposure analysis exercise. The results indicated that maximum estimated distances to Level A harassment isopleths were less than 5 m for all sources and hearing groups, with the exception of an estimated 53 m distance to the Level A harassment isopleth for high-frequency cetaceans (*i.e.*, harbor porpoises) during use of the Applied Acoustics AA251 Boomer (see Table 1 for source characteristics). Vineyard Northeast did not request authorization of take by Level A harassment and no take by Level A harassment is proposed for authorization by NMFS.

Ensonified Area

NMFS has developed a user-friendly methodology for estimating the extent of the Level B harassment isopleths associated with relevant HRG survey equipment (NMFS, 2020). This methodology incorporates frequency and directionality to refine estimated ensonified zones. For acoustic sources that operate with different beamwidths, the

maximum beamwidth was used, and the lowest frequency of the source was used when calculating the frequency-dependent absorption coefficient (Table 1).

NMFS considers the data provided by Crocker and Fratantonio (2016) to represent the best available information on source levels associated with HRG survey equipment and, therefore, recommends that source levels provided by Crocker and Fratantonio (2016) be incorporated in the method described above to estimate distances to harassment isopleths. In cases when the source level for a specific type of HRG equipment is not provided in Crocker and Fratantonio (2016), NMFS recommends that either the source levels provided by the manufacturer be used, or, in instances where source levels provided by the manufacturer are unavailable or unreliable, a proxy from Crocker and Fratantonio (2016) be used instead. Table 1 shows the HRG equipment types that may be used during the proposed surveys and the source parameters associated with each type of equipment. Appendix A of Vineyard Northeast's IHA application provides detailed information on the acoustic source parameters used to calculate distances to regulatory thresholds.

Results of modeling using the methodology described above indicated that, of the HRG survey equipment planned for use by Vineyard Northeast that has the potential to result in Level B harassment of marine mammals, the Applied Acoustics AA251 Boomer would produce the largest distance to the Level B harassment isopleth (178 m). Estimated distances to the Level B harassment isopleth for all source types evaluated here, including the boomer, are provided in Table 4. Although Vineyard Northeast does not expect to use the AA251 Boomer source on all planned survey days, it proposes to assume, for purposes of analysis, that the boomer sources would be used on all survey days and across all hours within a given survey day. This is a conservative approach, as the actual sources used on individual survey days, or during a portion of a survey day, may produce smaller distances to the Level B harassment isopleth.

Table 4 — Distances to Level B Harassment Isopleth

Equipment	Distance to Level B Harassment Isopleth (m)
Edge Tech Chirp 216	4.3
GeoMarine Geo Spark 2000 (400 tip)	141
Applied Acoustics AA 251 Boomer	178

Marine Mammal Occurrence

In this section, we provide the information about presence, density, or group dynamics of marine mammals that will inform the take calculations.

Habitat-based density models produced by the Duke University Marine Geospatial Ecology Laboratory (Roberts *et al.*, 2016, 2017, 2018, 2021) represent the best available information regarding marine mammal densities in the Survey Area. The density data presented by Roberts *et al.* (2016, 2017, 2018, 2021) incorporates aerial and shipboard line-transect survey data from NMFS and other organizations and incorporates data from 8 physiographic and 16 dynamic oceanographic and biological covariates, and controls for the influence of sea state, group size, availability bias, and perception bias on the probability of making a sighting. These density models were originally developed for all cetacean taxa in the U.S. Atlantic (Roberts *et al.*, 2016). In subsequent years, certain models have been updated based on additional data as well as certain methodological improvements. More information is available online at seamap.env.duke.edu/models/Duke-EC-GOM-2015/.

Density estimates for all species within the Survey Area were derived from habitat-based density modeling results reported by Roberts *et al.* (2016; 2017; 2018; 2021). Those data provide abundance estimates for species or species guild within 10 km x 10 km grid cells (100 km²) or, in the case of North Atlantic right whale densities, within 5 km x 5 km grid cells, on a monthly or annual basis, depending on the species. Using a GIS (ESRI 2017), the proposed Survey Area and the North Atlantic right whale

Cape Cod Bay SMA polygon shown in Figure 1 were used to select grid cells from the Roberts *et al.* (2016; 2017; 2018; 2021) data that contain the most recent monthly or annual estimates for each species for the months of May through December. For the months of January through April, only the proposed Survey Area polygon was used to select density grid cells since it excludes waters within Cape Cod Bay, where no surveys will occur while the Cape Cod Bay SMA is active from January 1 through May 15. The average monthly abundance for each species was calculated as the mean value of all grid cells within the Survey Area and then converted to density (individuals/1 km²) by dividing by 100 km². Finally, an average annual density was calculated by taking the mean across all 12 months for each species. See Table 8 in Vineyard Northeast's IHA application for all density information. When determining requested take numbers, Vineyard Northeast also considered average group sizes based on Protected Species Observer (PSO) sighting reports from previous surveys in the region.

Take Calculation and Estimation

Here we describe how the information provided above is brought together to produce a quantitative take estimate. In order to estimate the number of marine mammals predicted to be exposed to sound levels that would result in harassment, radial distances to predicted isopleths corresponding to harassment thresholds are calculated, as described above. The maximum distance (*i.e.*, 178 m distance associated with boomers) to the Level B harassment criterion and the estimated trackline distance traveled per day by a given survey vessel (*i.e.*, 80 km) are then used to calculate the daily ensonified area, or zone of influence (ZOI) around the survey vessel.

The ZOI is a representation of the maximum extent of the ensonified area around a HRG sound source over a 24-hr period. The ZOI for each piece of equipment operating at or below 180 kHz was calculated per the following formula:

$$\text{ZOI} = (\text{Distance/day} \times 2r) + \pi r^2$$

Where r is the linear distance from the source to the harassment isopleth.

The largest daily ZOI (28.6 km²), associated with the proposed use of boomers, was applied to all planned survey days.

Potential Level B density-based harassment exposures are estimated by multiplying the average annual density of each species within the Survey Area by the daily ZOI. That product is then multiplied by the number of planned survey days (869), and the product is rounded to the nearest whole number. These results are shown in Table 5.

For other less common species, the predicted densities from Roberts *et al.* (2016; 2017; 2018; 2021) are very low and the resulting density-based estimate is less than a single animal or a typical group size for the species. In such cases, the density-based exposure estimate is increased to the mean group size for the species to account for a chance encounter during an activity. Mean group sizes for each species were calculated from recent aerial and/or vessel-based surveys (Kraus *et al.*, 2016; Palka *et al.*, 2017) as shown in Table 5 (below) and Table 10 of the IHA application.

The larger of the two estimates from the approaches described above, density-based exposure estimates or mean group size, was selected as the amount of requested take as shown in Table 5. Additionally, based on observational data collected during prior HRG surveys in this area, the density of common dolphins predicted by the Roberts *et al.* (2018) model does not appear to adequately reflect the number of common dolphins that may be encountered during the planned surveys. Data collected by PSOs on survey vessels operating in 2020–2021 showed that an average of approximately 16 common dolphins may be observed within 200 m of a vessel (the approximate Level B harassment isopleth distance) per survey day (Vineyard-Wind 2021). Multiplying the anticipated 869 survey days by 16 common dolphins per day results in an estimated take of 13,904

common dolphins, so this has been used as the requested take of common dolphins shown in Table 5.

The estimated monthly density of seals provided in Roberts *et al.* (2018) includes all seal species present in the region as a single guild. To split the resulting “seal” density-based exposure estimate by species, Vineyard Northeast multiplied the estimate by the proportion of the combined abundance attributable to each species. Specifically, Vineyard Northeast summed the SAR N_{best} abundance estimates (Hayes *et al.* 2021) for the two species (gray seal = 27,300, harbor seal = 61,336; total = 88,636) and divided the total by the estimate for each species to get the proportion of the total for each species (gray seal = 0.308; harbor seal = 0.692). The total estimated exposure from the “seal” density provide by Roberts *et al.* (2018) was then multiplied by these proportions to get the species-specific density-based exposure estimates.

Given that most of the surveying will occur offshore (*i.e.*, water depths > 30 m), bottlenose dolphins encountered in the Survey Area would likely belong to the Western North Atlantic Offshore stock; therefore, all takes are being requested from this stock. However, it is possible that a few bottlenose dolphins encountered during nearshore surveys off the coast of New Jersey could be from the North Atlantic Northern Migratory Coastal stock. Similarly, the distributions of short- and long-finned pilot whales based on sighting data from the Ocean Biodiversity Information System database (OBIS 2021) indicate that pilot whale sightings in the Survey Area would most likely be long-finned pilot whales, so all requested pilot whale takes are for long-finned pilot whales.

Species considered to be rare or not expected to occur in the Survey Area were not included in Vineyard Northeast’s previous exposure estimates because the densities would be too low to provide meaningful results. Nonetheless, species considered to be rare are occasionally encountered. For example, white-beaked dolphins were observed in both 2019 and 2020 during marine site characterization surveys in the Survey Area

(Vineyard Wind 2019, 2020), with the sighting of white-beaked dolphins in 2019 consisting of 30 animals. Other rare species encountered in the Survey Area during previous surveys include the false killer whale in 2019 (5 individuals) and 2021 (1 individual) (Vineyard Wind 2019, 2021), and orca (killer whale) in 2022 (2 individuals; data not yet submitted). Vineyard Northeast is requesting take of each of these three species, based on the largest number of individuals observed within one year (Table 5).

Finally, recent deployments of passive acoustic devices in the New York Bight yielded detections of blue whale vocalizations approximately 20 nautical miles (nm) (37 km) southeast of the entrance to New York Harbor during the months of January, February, and March (Muirhead *et al.* 2018); blue whale vocalizations have also been recorded off the coast of Rhode Island during acoustic surveys (Kraus *et al.* 2016). More recently, during three years of monthly aerial surveys in the New York Bight (2017–2020), Zoidis *et al.* (2021) reported 3 sightings of blue whales, totaling 5 individuals. Although sightings of blue whales in the Survey Area are rare, in light of these recent observations of blue whales, Vineyard Northeast is requesting take of one blue whale based on the average group size (Palka *et al.*, 2017) (Table 5).

Table 5 – Summary of Take Numbers Proposed for Authorization

Species	Annual average density (km ²)	Density-based Exposure Estimate	Mean Group Size ¹	Takes by Level B Harassment Requested	Abundance	Proposed Takes as Percent of Stock (%)
Blue whale ²	0.00000	0.2	1.0	1	402	0.2
Fin whale	0.00149	54.0	1.8	55	6,802	0.8
Humpback whale	0.00084	32.5	2.0	33	1,396	2.4
Minke whale	0.00062	29.0	1.2	30	21,968	0.1
North Atlantic right whale	0.00164	27.7	2.4	28	368	7.6
Sei whale	0.00005	3.4	1.6	4	6,292	0.1
Sperm whale	0.00006	8.4	1.5	9	4,349	0.2

Orca (killer whale) ²	--	--	--	2	Unk	0.0
False killer whale ²	--	--	--	5	1,791	0.3
Atlantic spotted dolphin	0.0008	13.6	29.0	29	39,921	0.1
Atlantic white-sided dolphin	0.02226	791.1	27.9	792	92,233	0.9
Bottlenose dolphin (Western North Atlantic offshore stock)	0.0403	507.1	7.8	508	62,851	0.8
Bottlenose dolphin (Western North Atlantic northern migratory coastal stock)	--	--	--	--	--	--
Common dolphin	0.0544	816.4	34.9	24,480	172,974	0.1
Long-finned pilot whale	0.00459	285.1	8.4	286	39,215	0.7
White-beaked dolphin ²	--	--	--	30	536,016	0.0
Risso's dolphin	0.00012	70.5	5.4	71	35,493	0.2
Harbor porpoise	0.02858	1431.3	2.7	1,432	95,543	0.1
Gray seal	0.09784	294.2	0.4	295	27,131	1.0
Harbor seal		661.1	1.0	662	75,834	0.9

¹ - Mean group size based on Kraus *et al.*, 2016 (fin, humpback, minke, North Atlantic right, sei, and pilot whales; Atlantic white-sided, bottlenose, and common dolphins; harbor porpoise) or Palka *et al.*, 2017 (blue and sperm whales; Atlantic spotted and Risso's dolphin; harbor and gray seals)

² - Rare (or unlikely to occur) species

The take numbers shown in Table 5 are those requested by Vineyard Northeast.

NMFS concurs with the requested take numbers and proposes to authorize them.

Proposed Mitigation

In order to issue an IHA under section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to the activity, and other means of effecting the least practicable impact on the species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of the species or stock for taking for certain subsistence uses (latter not applicable for this action). NMFS regulations require applicants for incidental take authorizations to include information about the availability and feasibility (economic and

technological) of equipment, methods, and manner of conducting the activity or other means of effecting the least practicable adverse impact upon the affected species or stocks and their habitat (50 CFR 216.104(a)(11)).

In evaluating how mitigation may or may not be appropriate to ensure the least practicable adverse impact on species or stocks and their habitat, as well as subsistence uses where applicable, we carefully consider two primary factors:

(1) The manner in which, and the degree to which, the successful implementation of the measure(s) is expected to reduce impacts to marine mammals, marine mammal species or stocks, and their habitat. This considers the nature of the potential adverse impact being mitigated (likelihood, scope, range). It further considers the likelihood that the measure will be effective if implemented (probability of accomplishing the mitigating result if implemented as planned), the likelihood of effective implementation (probability implemented as planned), and;

(2) The practicability of the measures for applicant implementation, which may consider such things as cost, impact on operations, and, in the case of a military readiness activity, personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity.

Mitigation for Marine Mammals and their Habitat

NMFS proposes the following mitigation measures be implemented during Vineyard Northeast's proposed marine site characterization surveys. Pursuant to section 7 of the ESA, Vineyard Northeast would also be required to adhere to relevant Project Design Criteria (PDC) of the NMFS' Greater Atlantic Regional Fisheries Office (GARFO) programmatic consultation (specifically PDCs 4, 5, and 7) regarding geophysical surveys along the U.S. Atlantic coast (<https://www.fisheries.noaa.gov/new-england-mid-atlantic/consultations/section-7-take-reporting-programmatics-greater->

atlantic#offshore-wind-site-assessment-and-site-characterization-activities-programmatic-consultation).

Marine Mammal Shutdown Zones and Level B Harassment Zone

Marine mammal shutdown zones (SZs) would be established around the HRG survey equipment and monitored by PSOs:

- 500-m SZ for North Atlantic right whales
- 100-m SZ for all other marine mammals

If a marine mammal is detected approaching or entering the SZs during the HRG survey, the vessel operator would adhere to the shutdown procedures described below to minimize noise impacts on the animals. These stated requirements will be included in the site-specific training provided to the survey team.

Pre-Start Clearance

Marine mammal clearance zones (CZs) would be established around the HRG survey equipment and monitored by PSOs:

- 500-m CZ for all ESA-listed marine mammals; and
- 100-m CZ for all other marine mammals

Vineyard Northeast would implement a 30-minute pre-start clearance period prior to initiation of ramp-up of specified HRG equipment. During this period, CZs would be monitored by PSOs, using the appropriate visual technology. Ramp-up may not be initiated if any marine mammal(s) is within its respective CZ. If a marine mammal is observed within its CZ during the pre-start clearance period, ramp-up may not begin until the animal(s) has been observed exiting its respective CZ or until an additional time has elapsed with no further sighting (*i.e.*, 15 minutes for small odontocetes and seals, and 30 minutes for all other species).

Ramp-Up of Survey Equipment

When technically feasible, a ramp-up procedure would be used for HRG survey equipment capable of adjustment of energy levels at the start or restart of survey activities. The ramp-up procedure would be used at the beginning of HRG survey activities to provide additional protection to marine mammals in or near the Survey Area by allowing them to vacate the area prior to the commencement of survey equipment operation at full power. A ramp-up would begin with the powering up of the smallest acoustic HRG equipment at its lowest practical power output appropriate for the survey. When technically feasible, the power would then be gradually turned up and other acoustic sources would be added.

Ramp-up activities will be delayed if a marine mammal(s) enters its respective CZ. Ramp-up will continue if the animal has been observed exiting its respective CZ or until an additional period has elapsed with no additional sightings (*i.e.*, 15 minutes for small odontocetes and seals, and 30 minutes for all other species).

Activation of survey equipment through ramp-up procedures may not occur when visual observation of the pre-start clearance/shutdown zone is not expected to be effective using the appropriate visual technology (*i.e.*, during inclement conditions such as heavy rain or fog).

Shutdown Procedures

An immediate shutdown of the specified HRG survey equipment would be required if a marine mammal is sighted entering or within its respective SZ. The vessel operator must comply immediately with any call for shutdown by the PSO. Any disagreement between the PSO and vessel operator should be discussed only after shutdown has occurred. Subsequent restart of the survey equipment can be initiated if the animal has been observed exiting its respective SZ or until an additional time has elapsed (*i.e.*, 15 minutes for harbor porpoise, 30 minutes for all other species).

If a species for which authorization has not been granted, or a species for which authorization has been granted but the authorized number of takes have been met, approaches or is observed within the applicable Level B harassment zone (Table 4), shutdown would occur.

If the acoustic source is shut down for reasons other than mitigation (*e.g.*, mechanical difficulty) for less than 30 minutes, it may be activated again without ramp-up if PSOs have maintained constant observation and no detections of any marine mammal have occurred within the respective SZs. If the acoustic source is shut down for a period longer than 30 minutes, then pre-start clearance and ramp-up procedures will be initiated as described in the previous section.

The shutdown requirement would be waived for pinnipeds and for small delphinids of the following genera: *Delphinus*, *Lagenorhynchus*, *Stenella*, and *Tursiops*. Specifically, if a delphinid from the specified genera or a pinniped is visually detected approaching the vessel (*i.e.*, to bow ride) or towed equipment, shutdown is not required. Furthermore, if there is uncertainty regarding identification of a marine mammal species (*i.e.*, whether the observed marine mammal(s) belongs to one of the delphinid genera for which shutdown is waived), PSOs must use best professional judgement in making the decision to call for a shutdown. Additionally, shutdown is required if a delphinid or pinniped detected in the shutdown zone and belongs to a genus other than those specified.

Shutdown, pre-start clearance, and ramp-up procedures would not be required during HRG survey operations using only non-impulsive sources (*e.g.*, echosounders), other than non-parametric sub-bottom profilers (*e.g.*, CHIRP SBPs).

Vessel Strike Avoidance

Vineyard Northeast must ensure that vessel operators and crew maintain a vigilant watch for cetaceans and pinnipeds and slow down or stop their vessels to avoid striking these species. Survey vessel crew members responsible for navigation duties will receive

site-specific training on marine mammals sighting/reporting and vessel strike avoidance measures. Vessel strike avoidance measures include the following, except under circumstances when complying with these requirements would put the safety of the vessel or crew at risk:

- Vessel operators and crews must maintain a vigilant watch for all protected species and slow down, stop their vessel(s), or alter course, as appropriate and regardless of vessel size, to avoid striking any protected species. A visual observer aboard the vessel must monitor a vessel strike avoidance zone based on the appropriate separation distance around the vessel (distances stated below). Visual observers monitoring the vessel strike avoidance zone may be third-party observers (*i.e.*, PSOs) or crew members, but crew members responsible for these duties must be provided sufficient training to 1) distinguish protected species from other phenomena and 2) broadly to identify a marine mammal as a North Atlantic right whale, other whale (defined in this context as sperm whales or baleen whales other than North Atlantic right whales), or other marine mammal.

- Members of the monitoring team will consult NMFS North Atlantic right whale reporting system and Whale Alert at the start of every PSO shift, for situational awareness regarding the presence of North Atlantic right whales throughout the Survey Area, and for the establishment of Slow Zones (including visual-detection-triggered dynamic management areas (DMAs) and acoustically-triggered slow zones) within or near the Survey Area.

- All survey vessels, regardless of size, must observe a 10-knot speed restriction in specific areas designated by NMFS for the protection of North Atlantic right whales from vessel strikes, including SMAs and DMAs when in effect;

- All vessels greater than or equal to 19.8 m in overall length operating from November 1 through April 30 will operate at speeds of 10 knots or less at all times;

- All vessels must reduce their speed to 10 knots or less when mother/calf pairs, pods, or large assemblages of cetaceans are observed near a vessel;
- All vessels must maintain a minimum separation distance of 500 m from North Atlantic right whales and other ESA-listed species. If an ESA-listed species is sighted within the relevant separation distance, the vessel must steer a course away at 10 knots or less until the 500-m separation distance has been established. If a whale is observed but cannot be confirmed as a species that is not ESA-listed, the vessel operator must assume that it is an ESA-listed species and take appropriate action.
- All vessels must, to the maximum extent practicable, attempt to maintain a minimum separation distance of 100 m from all non-ESA listed whales,
- All vessels must, to the maximum extent practicable, attempt to maintain a minimum separation distance of 50 m from all other marine mammals, with an understanding that at times this may not be possible (*e.g.*, for animals that approach the vessel).
- When marine mammals are sighted while a vessel is underway, the vessel must take action as necessary to avoid violating the relevant separation distance (*e.g.*, attempt to remain parallel to the animal's course, avoid excessive speed or abrupt changes in direction until the animal has left the area). If marine mammals are sighted within the relevant separation distance, the vessel must reduce speed and shift the engine to neutral, not engaging the engines until animals are clear of the area. This does not apply to any vessel towing gear or any vessel that is navigationally constrained.

Seasonal Restrictions

Vineyard Northeast proposes to refrain from conducting survey activities using HRG equipment operating at or below 180 kHz from January 1 through May 15 within the North Atlantic right whale SMA in Cape Cod Bay.

Crew Training

Project-specific training will be conducted for all vessel crew prior to the start of a survey and during any changes in crew such that all survey personnel are fully aware and understand the mitigation, monitoring, and reporting requirements. Prior to implementation with vessel crews, the training program will be provided to NMFS for review and approval. Confirmation of the training and understanding of the requirements will be documented on a training course log sheet. Signing the log sheet will certify that the crew member understands and will comply with the necessary requirements throughout the survey activities.

Based on our evaluation of the applicant's proposed measures, as well as other measures considered by NMFS, NMFS has preliminarily determined that the proposed mitigation measures provide the means of effecting the least practicable impact on marine mammal species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance.

Proposed Monitoring and Reporting

In order to issue an IHA for an activity, section 101(a)(5)(D) of the MMPA states that NMFS must set forth requirements pertaining to the monitoring and reporting of such taking. The MMPA implementing regulations at 50 CFR 216.104 (a)(13) indicate that requests for authorizations must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present in the proposed action area. Effective reporting is critical to both compliance as well as ensuring that the most value is obtained from the required monitoring.

Monitoring and reporting requirements prescribed by NMFS should contribute to improved understanding of one or more of the following:

- Occurrence of marine mammal species or stocks in the area in which take is anticipated (*e.g.*, presence, abundance, distribution, density).
- Nature, scope, or context of likely marine mammal exposure to potential stressors/impacts (individual or cumulative, acute or chronic), through better understanding of: (1) action or environment (*e.g.*, source characterization, propagation, ambient noise); (2) affected species (*e.g.*, life history, dive patterns); (3) co-occurrence of marine mammal species with the action; or (4) biological or behavioral context of exposure (*e.g.*, age, calving or feeding areas).
- Individual marine mammal responses (behavioral or physiological) to acoustic stressors (acute, chronic, or cumulative), other stressors, or cumulative impacts from multiple stressors.
- How anticipated responses to stressors impact either: (1) long-term fitness and survival of individual marine mammals; or (2) populations, species, or stocks.
- Effects on marine mammal habitat (*e.g.*, marine mammal prey species, acoustic habitat, or other important physical components of marine mammal habitat).
- Mitigation and monitoring effectiveness.

Proposed Monitoring Measures

Visual monitoring will be performed by qualified, NMFS-approved PSOs, the resumes of whom will be provided to NMFS for review and approval prior to the start of survey activities. Vineyard Northeast would employ independent, dedicated, trained PSOs, meaning that the PSOs must 1) be employed by a third-party observer provider, 2) have no tasks other than to conduct observational effort, collect data, and communicate with and instruct relevant vessel crew with regard to the presence of marine mammals and mitigation requirements (including brief alerts regarding maritime hazards), and 3) have successfully completed an approved PSO training course appropriate for their designated task. On a case-by-case basis, non-independent observers may be approved by

NMFS for limited, specific duties in support of approved, independent PSOs on smaller vessels with limited crew capacity operating in nearshore waters. Section 5 of the draft IHA contains further details regarding PSO approval.

The PSOs will be responsible for monitoring the waters surrounding each survey vessel to the farthest extent permitted by sighting conditions, including shutdown zones, during all HRG survey operations. PSOs will visually monitor and identify marine mammals, including those approaching or entering the established shutdown zones during survey activities. It will be the responsibility of the Lead PSO on duty to communicate the presence of marine mammals to the vessel operator as well as to communicate the action(s) that are necessary to ensure mitigation and monitoring requirements are implemented as appropriate.

During all HRG survey operations (*e.g.*, any day on which use of a specified HRG source is planned to occur), a minimum of one PSO must be on duty during daylight operations on each survey vessel, conducting visual observations at all times on all active survey vessels during daylight hours (*i.e.*, from 30 minutes prior to sunrise through 30 minutes following sunset). Two PSOs will be on watch during nighttime operations. The PSO(s) would ensure 360° visual coverage around the vessel from the most appropriate observation posts and would conduct visual observations using binoculars and/or night vision goggles and the naked eye while free from distractions and in a consistent, systematic, and diligent manner. PSOs may be on watch for a maximum of 4 consecutive hours followed by a break of at least 2 hours between watches and may conduct a maximum of 12 hours of observation per 24-hr period. In cases where multiple vessels are surveying concurrently, any observations of marine mammals would be communicated to PSOs on all nearby survey vessels.

PSOs must be equipped with binoculars and have the ability to estimate distance and bearing to detect marine mammals, particularly in proximity to shutdown zones.

Reticulated binoculars must also be available to PSOs for use as appropriate based on conditions and visibility to support the sighting and monitoring of marine mammals. During nighttime operations, night-vision goggles with thermal clip-ons and infrared technology would be used. Position data would be recorded using hand-held or vessel GPS units for each sighting.

During good conditions (*e.g.*, daylight hours; Beaufort Sea State (BSS) 3 or less), to the maximum extent practicable, PSOs would also conduct observations when the acoustic source is not operating for comparison of sighting rates and behavior with and without use of the active acoustic sources. Any observations of marine mammals by crew members aboard any vessel associated with the survey would be relayed to the PSO team. Data on all PSO observations would be recorded based on standard PSO collection requirements. This would include dates, times, and locations of survey operations; dates and times of observations, location and weather; details of marine mammal sightings (*e.g.*, species, numbers, behavior); and details of any observed marine mammal behavior that occurs (*e.g.*, noted behavioral disturbances).

Proposed Reporting Measures

Within 90 days after completion of survey activities or expiration of this IHA, whichever comes sooner, a final technical report will be provided to NMFS that fully documents the methods and monitoring protocols, summarizes the data recorded during monitoring, summarizes the number of marine mammals observed during survey activities (by species, when known), summarizes the mitigation actions taken during surveys (including what type of mitigation and the species and number of animals that prompted the mitigation action, when known), and provides an interpretation of the results and effectiveness of all mitigation and monitoring. A final report must be submitted within 30 days following resolution of any comments on the draft report. All draft and final marine mammal and acoustic monitoring reports must be submitted to

PR.ITP.MonitoringReports@noaa.gov and *ITP.Esch@noaa.gov*. The report must contain at minimum, the following:

- PSO names and affiliations;
- Dates of departures and returns to port with port name;
- Dates and times (Greenwich Mean Time) of survey effort and times

corresponding with PSO effort;

- Vessel location (latitude/longitude) when survey effort begins and ends;

vessel location at beginning and end of visual PSO duty shifts;

- Vessel heading and speed at beginning and end of visual PSO duty shifts

and upon any line change;

- Environmental conditions while on visual survey (at beginning and end of

PSO shift and whenever conditions change significantly), including wind speed and

direction, Beaufort sea state, Beaufort wind force, swell height, weather conditions, cloud cover, sun glare, and overall visibility to the horizon;

- Factors that may be contributing to impaired observations during each PSO shift change or as needed as environmental conditions change (*e.g.*, vessel traffic, equipment malfunctions); and

- Survey activity information, such as type of survey equipment in

operation, acoustic source power output while in operation, and any other notes of

significance (*i.e.*, pre-start clearance survey, ramp-up, shutdown, end of operations, etc.).

If a marine mammal is sighted, the following information should be recorded:

- Watch status (sighting made by PSO on/off effort, opportunistic, crew, alternate vessel/platform);

- PSO who sighted the animal;

- Time of sighting;

- Vessel location at time of sighting;

- Water depth;
- Direction of vessel's travel (compass direction);
- Direction of animal's travel relative to the vessel;
- Pace of the animal;
- Estimated distance to the animal and its heading relative to vessel at initial sighting;
- Identification of the animal (*e.g.*, genus/species, lowest possible taxonomic level, or unidentified); also note the composition of the group if there is a mix of species;
- Estimated number of animals (high/low/best);
- Estimated number of animals by cohort (adults, yearlings, juveniles, calves, group composition, etc.);
- Description (as many distinguishing features as possible of each individual seen, including length, shape, color, pattern, scars or markings, shape and size of dorsal fin, shape of head, and blow characteristics);
- Detailed behavior observations (*e.g.*, number of blows, number of surfaces, breaching, spyhopping, diving, feeding, traveling; as explicit and detailed as possible; note any observed changes in behavior);
- Animal's closest point of approach and/or closest distance from the center point of the acoustic source;
- Platform activity at time of sighting (*e.g.*, deploying, recovering, testing, data acquisition, other); and
- Description of any actions implemented in response to the sighting (*e.g.*, delays, shutdown, ramp-up, speed or course alteration, etc.) and time and location of the action.

If a North Atlantic right whale is observed at any time by PSOs or personnel on

any project vessels, during surveys or during vessel transit, Vineyard Northeast would report sighting information to the NMFS North Atlantic Right Whale Sighting Advisory System (866) 755-6622) within two hours of occurrence, when practicable, or no later than 24 hours after occurrence. North Atlantic right whale sightings in any location may also be reported to the U.S. Coast Guard via channel 16.

In the event that Vineyard Northeast personnel discover an injured or dead marine mammal, Vineyard Northeast would report the incident to the NMFS Office of Protected Resources (OPR) and the NMFS New England/Mid-Atlantic Stranding Coordinator as soon as feasible. The report would include the following information:

1. Time, date, and location (latitude/longitude) of the first discovery (and updated location information if known and applicable);
2. Species identification (if known) or description of the animal(s) involved;
3. Condition of the animal(s) (including carcass condition if the animal is dead);
4. Observed behaviors of the animal(s), if alive;
5. If available, photographs or video footage of the animal(s); and
6. General circumstances under which the animal was discovered.

In the unanticipated event of a ship strike of a marine mammal by any vessel involved in the activities covered by the IHA, Vineyard Northeast would report the incident to the NMFS OPR and the NMFS New England/Mid-Atlantic Stranding Coordinator as soon as feasible. The report would include the following information:

- Time, date, and location (latitude/longitude) of the incident;
- Species identification (if known) or description of the animal(s) involved;
- Vessel's speed during and leading up to the incident;
- Vessel's course/heading and what operations were being conducted (if applicable);

- Status of all sound sources in use;
- Description of avoidance measures/requirements that were in place at the time of the strike and what additional measures were taken, if any, to avoid strike;
- Environmental conditions (*e.g.*, wind speed and direction, Beaufort sea state, cloud cover, visibility) immediately preceding the strike;
- Estimated size and length of animal that was struck;
- Description of the behavior of the marine mammal immediately preceding and following the strike;
- If available, description of the presence and behavior of any other marine mammals immediately preceding the strike;
- Estimated fate of the animal (*e.g.*, dead, injured but alive, injured and moving, blood or tissue observed in the water, status unknown, disappeared); and
- To the extent practicable, photographs or video footage of the animal(s).

Negligible Impact Analysis and Determination

NMFS has defined negligible impact as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival (50 CFR 216.103). A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (*i.e.*, population-level effects). An estimate of the number of takes alone is not enough information on which to base an impact determination. In addition to considering estimates of the number of marine mammals that might be “taken” through harassment, NMFS considers other factors, such as the likely nature of any responses (*e.g.*, intensity, duration), the context of any responses (*e.g.*, critical reproductive time or location, migration), as well as effects on habitat, and the likely effectiveness of the mitigation. We also assess the number, intensity, and context of estimated takes by evaluating this information relative to population status.

Consistent with the 1989 preamble for NMFS' implementing regulations (54 FR 40338; September 29, 1989), the impacts from other past and ongoing anthropogenic activities are incorporated into this analysis via their impacts on the environmental baseline (*e.g.*, as reflected in the regulatory status of the species, population size and growth rate where known, ongoing sources of human-caused mortality, or ambient noise levels).

To avoid repetition, our analysis applies to all the species listed in Table 5, given that NMFS expects the anticipated effects of the proposed survey to be similar in nature. Where there are meaningful differences between species or stocks - as is the case of the North Atlantic right whale - they are included as separate subsections below. NMFS does not anticipate that serious injury or mortality would occur as a result from HRG surveys, even in the absence of mitigation, and no serious injury or mortality is proposed to be authorized. As discussed in the **Potential Effects** section, non-auditory physical effects and vessel strike are not expected to occur. NMFS expects that all potential Level B harassment takes would be in the form of temporary avoidance of the area or decreased foraging (if such activity was occurring), reactions that are considered to be of low severity and with no lasting biological consequences (*e.g.*, Southall *et al.*, 2007). Even repeated Level B harassment of some small subset of an overall stock is unlikely to result in any significant realized decrease in viability for the affected individuals, and thus would not result in any adverse impact to the stock as a whole. As described above, Level A harassment is not expected to occur, even absent mitigation, given the nature of the operations and the estimated size of the Level A harassment zones.

In addition to being temporary, the maximum behavioral harassment zone radius is 178 m (associated with the Applied Acoustics AA251 Boomer). When estimating Level B harassment take numbers, Vineyard Northeast made the conservative assumption that this maximum zone size applied to all 869 survey days when, in reality, the Applied Acoustics AA251 Boomer would not be used throughout the entire 24 hours of every

proposed survey day. The other acoustic sources with the potential to result in take of marine mammals produced Level B harassment zones with even smaller radii (141 m, Edge Tech CHIRP 216; 4 m, GeoMarine Geo Spark 2000). Therefore, the ensonified area surrounding each acoustic source is relatively small compared to the overall distribution of the animals in the area and their use of the habitat.

The planned Survey Area encompasses, or is in close proximity to, feeding BIAs for North Atlantic right whales (February-April/April-June), humpback whales (March-December), fin whales (March-October), sei whales (May-November), and minke whales (March-November), as well as the migratory BIA for North Atlantic right whales (November 1-April 30) (LaBrecque *et al.*, 2015). Most of these feeding BIAs are extensive and sufficiently large (*e.g.*, 705 km² and 3,149 km² for North Atlantic right whales; 47,701 km² for humpback whales; 2,933 km² for fin whales; 56,609 km² for sei whales), and the acoustic footprint of the planned survey is sufficiently small that feeding opportunities for these species would not be reduced appreciably. In addition, feeding behavior is not likely to be significantly impacted as prey species are mobile and are broadly distributed throughout the Survey Area; therefore, marine mammals that may be temporarily displaced during survey activities are expected to be able to resume foraging once they have moved away from areas with disturbing levels of underwater noise. Because of the temporary nature of the disturbance and the availability of similar habitat and resources in the surrounding area, the impacts to marine mammals and the food sources that they utilize are not expected to cause significant or long-term consequences for individual marine mammals or their populations. There are no rookeries, mating or calving grounds known to be biologically important to marine mammals within the proposed Survey Area.

North Atlantic Right Whales

The status of the North Atlantic right whale population is of heightened concern and, therefore, merits additional analysis. As noted previously, elevated North Atlantic right whale mortalities began in June 2017 and there is currently an active UME. Overall, preliminary findings support human interactions, specifically vessel strikes and entanglements, as the cause of death for the majority of North Atlantic right whales.

The proposed Survey Area partially overlaps with the migratory corridor BIA and migratory route SMA for North Atlantic right whales, which extends from Massachusetts to Florida, from the coast to beyond the shelf break. That the spatial acoustic footprint of the proposed survey is very small relative to the spatial extent of the available migratory habitat supports the expectation that North Atlantic right whale migration will not be impacted by the proposed survey. Required vessel strike avoidance measures will also decrease risk of ship strike during migration. Additionally, Vineyard Northeast would be required to adhere to a 10-knot speed restriction in the migratory corridor SMA, and in any DMA(s), should NMFS establish one (or more) in the Survey Area.

The most northern and northeastern portions of the proposed Survey Area overlap with Cape Cod Bay (January 1-May 15), Off Race Point (March 1-April 30), and Great South Channel (April 1-July 31) SMAs. Vineyard Northeast's proposed seasonal restriction on survey activities in Cape Cod Bay (which is also part of a feeding BIA (February 1-April 30) and designated critical foraging habitat for North Atlantic right whales) when the SMA is active minimizes potential impacts on the species' foraging when densities of North Atlantic right whales and their prey are expected to be highest in that section of the Survey Area. The seasonal restriction also minimizes the likelihood that survey activities would occur during the Off Race Point SMA, which overlaps in time with and is in close proximity to the Cape Cod Bay SMA. Finally, although the eastern edge of Survey Area partially overlaps with the western-most portion of the Great South Channel feeding BIA, SMA, and critical foraging habitat, the relatively small size of

the ensonified area relative to the foraging habitat available to North Atlantic right whales, it is unlikely that foraging opportunities and behavior would be adversely affected by survey operations.

The slow survey speed (approximately 4 knots) and required vessel strike avoidance measures will decrease risk of ship strike such that no ship strike is expected to occur during Vineyard Northeast's proposed activities. The 500-m shutdown zone for North Atlantic right whales is conservative (considering the distance to the Level B harassment isopleth for the most impactful acoustic source (*i.e.*, boomer) is estimated to be 178 m) and thereby minimizes the potential for behavioral harassment of this species.

Again, Level A harassment is not expected due to the small PTS zones associated with HRG equipment types proposed for use. The proposed behavioral harassment takes of North Atlantic right whale are not expected to exacerbate or compound upon the ongoing UME. The limited North Atlantic right whale behavioral harassment takes proposed for authorization are expected to be of a short duration, and given the number of estimated takes, repeated exposures of the same individual are not expected. As stated previously, it is unlikely that North Atlantic right whale prey availability would be adversely affected given the relatively small size of the ensonified area during Vineyard Northeast's proposed survey activities. Accordingly, NMFS does not anticipate potential take of North Atlantic right whales that would result from Vineyard Northeast's proposed activities would impact annual rates of recruitment or survival. Thus, any takes that occur would not result in population level impacts.

Other Marine Mammal Species with Active UMEs

As noted above, there are several active UMEs occurring in the vicinity of Vineyard Northeast's proposed Survey Area. Elevated humpback whale mortalities have occurred along the Atlantic coast from Maine through Florida since January 2016. Of the cases examined, approximately half had evidence of human interaction (ship strike or

entanglement). The UME does not yet provide cause for concern regarding population-level impacts. Despite the UME, the relevant population of humpback whales (the West Indies breeding population, or DPS) remains stable at approximately 12,000 individuals.

Beginning in January 2017, elevated minke whale strandings have occurred along the Atlantic coast from Maine through South Carolina, with highest numbers in Massachusetts, Maine, and New York. This event does not provide cause for concern regarding population level impacts, as the likely population abundance is greater than 20,000 whales.

Elevated numbers of harbor seal and gray seal mortalities were first observed in July 2018 and have occurred across Maine, New Hampshire, and Massachusetts. Based on tests conducted so far, the main pathogen found in the seals is phocine distemper virus, although additional testing to identify other factors that may be involved in this UME are underway. The UME does not yet provide cause for concern regarding population-level impacts to any of these stocks. For harbor seals, the population abundance is over 61,000 and annual M/SI (339) is well below PBR (1,729) (Hayes *et al.*, 2021). The population abundance for gray seals in the United States is over 27,000, with an estimated abundance, including seals in Canada, of approximately 450,000. In addition, the abundance of gray seals is likely increasing in the U.S. Atlantic as well as in Canada (Hayes *et al.*, 2021).

The required mitigation measures are expected to reduce the number and/or severity of proposed takes for all species listed in Table 5, including those with active UMEs, to the level of least practicable adverse impact. In particular, ramp-up procedures would provide animals in the vicinity of the survey vessel the opportunity to move away from the sound source before HRG survey equipment reaches full energy, thus preventing them from being exposed to sound levels that have the potential to cause injury (Level A harassment) or more severe Level B harassment. As discussed

previously, take by Level A harassment (injury) is considered unlikely, even absent mitigation, based on the characteristics of the signals produced by the acoustic sources planned for use. Implementation of the required mitigation would further reduce this potential. Therefore, NMFS is not proposing any Level A harassment for authorization.

NMFS expects that takes would be in the form of short-term behavioral harassment by way of temporary vacating of the area, or decreased foraging (if such activity was occurring)—reactions that (at the scale and intensity anticipated here) are considered to be of low severity, with no lasting biological consequences. Since both the sources and marine mammals are mobile, animals would only be exposed briefly to a small ensonified area that might result in take. Additionally, required mitigation measures would further reduce exposure to sound that could result in more severe behavioral harassment.

Biologically Important Areas for Other Species

As previously discussed, impacts from the proposed project are expected to be localized to the specific area of activity and only during periods of time where Vineyard Northeast's acoustic sources are active. While areas of biological importance to foraging fin whales, sei whales, minke whales, and humpback whales exist within the proposed Survey Area, NMFS does not expect this proposed action to affect these areas or any species' ability to utilize prey resources within the BIAs, given the nature of the survey activity, and the combination of the mitigation and monitoring measures being required of Vineyard Northeast.

Several major haul-out sites exist for harbor seals within the Survey Area along the New Jersey coast (*e.g.*, Great Bay, Sandy Hook, and Barnegat Inlet), New York Coast (*e.g.*, Montauk Island), and Rhode Island coast (*e.g.*, Narragansett Bay), and for gray and harbor seals along the Massachusetts coast (*e.g.*, Cape Cod, Monomoy Island)

(DiGiovanni and Sabrosky 2010). However, as hauled-out seals would be out of the water, no in-water effects are expected.

Preliminary Determinations

In summary and as described above, the following factors primarily support our preliminary determination that the impacts resulting from this activity are not expected to adversely affect the species or stock through effects on annual rates of recruitment or survival:

- No mortality or serious injury is anticipated or proposed to be authorized;
- No Level A harassment (PTS) is anticipated, even in the absence of mitigation measures, or proposed for authorization;
- Any foraging interruptions are expected to be short term and unlikely to be cause significant impacts;
- Impacts on marine mammal habitat and species that serve as prey for marine mammals are expected to be minimal and the alternate areas of similar habitat value for marine mammals are readily available;
- Take is anticipated to be by Level B behavioral harassment only, consisting of brief startling reactions and/or temporary avoidance of the Survey Area;
- Survey activities would occur in such a comparatively small portion of the BIA for North Atlantic right whale migration, including a small area of designated critical habitat, that any avoidance of the area due to survey activities would not affect migration. In addition, the mitigation measure to shut down at 500 m to minimize potential for Level B behavioral harassment would limit both the number and severity of take of the species.
- Similarly, due to the relatively small footprint of the survey activities in relation to the size of BIAs for North Atlantic right, humpback, fin, sei, and minke whale foraging, the survey activities would not affect foraging behavior of these species; and

- Proposed mitigation measures, including visual monitoring and shutdowns, are expected to minimize the intensity of potential impacts to marine mammals.

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat and taking into consideration the implementation of the proposed monitoring and mitigation measures, NMFS preliminarily finds that the total marine mammal take from the proposed activity will have a negligible impact on all affected marine mammal species or stocks.

Small Numbers

As noted above, only small numbers of incidental take may be authorized under sections 101(a)(5)(A) and (D) of the MMPA for specified activities other than military readiness activities. The MMPA does not define small numbers and so, in practice, where estimated numbers are available, NMFS compares the number of individuals taken to the most appropriate estimation of abundance of the relevant species or stock in our determination of whether an authorization is limited to small numbers of marine mammals. When the predicted number of individuals to be taken is less than one third of the species or stock abundance, the take is considered to be of small numbers. Additionally, other qualitative factors may be considered in the analysis, such as the temporal or spatial scale of the activities.

NMFS proposes to authorize incidental take (by Level B harassment only) of 19 marine mammal species (with 20 managed stocks). The total amount of takes proposed for authorization relative to the best available population abundance is less than 8 percent for all stocks, less than 3 percent for 19 stocks, and less than 1 percent for 18 stocks (Table 5). Therefore, NMFS preliminarily finds that small numbers of marine mammals may be taken relative to the estimated overall population abundances for those stocks.

Based on the analysis contained herein of the proposed activity (including the proposed mitigation and monitoring measures) and the anticipated take of marine mammals, NMFS preliminarily finds that small numbers of marine mammals will be taken relative to the population size of the affected species or stocks.

Unmitigable Adverse Impact Analysis and Determination

There are no relevant subsistence uses of the affected marine mammal stocks or species implicated by this action. Therefore, NMFS has determined that the total taking of affected species or stocks would not have an unmitigable adverse impact on the availability of such species or stocks for taking for subsistence purposes.

Endangered Species Act

Section 7(a)(2) of the Endangered Species Act of 1973 (ESA: 16 U.S.C. 1531 *et seq.*) requires that each Federal agency insure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat. To ensure ESA compliance for the issuance of IHAs, NMFS Office of Protected Resources (OPR) consults internally whenever we propose to authorize take for endangered or threatened species.

NMFS OPR is proposing to authorize the incidental take of four species of marine mammals which are listed under the ESA, including the North Atlantic right, blue, fin, sei, and sperm whale, and has determined that this activity falls within the scope of activities analyzed in NMFS GARFO's programmatic consultation regarding geophysical surveys along the U.S. Atlantic coast in the three Atlantic Renewable Energy Regions (completed June 29, 2021; revised September 2021). NMFS GARFO concurred with this determination.

Proposed Authorization

As a result of these preliminary determinations, NMFS proposes to issue an IHA to Vineyard Northeast authorizing take, by Level B harassment incidental to conducting marine site characterization surveys off the coast from Massachusetts to New Jersey from June 22, 2022, through June 21, 2023, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated. A draft of the proposed IHA can be found at <https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-other-energy-activities-renewable>.

Request for Public Comments

We request comment on our analyses, the proposed authorization, and any other aspect of this notice of proposed IHA for the proposed site characterization surveys. We also request at this time comment on the potential Renewal of this proposed IHA as described in the paragraph below. Please include with your comments any supporting data or literature citations to help inform decisions on the request for this proposed IHA or a subsequent Renewal IHA.

On a case-by-case basis, NMFS may issue a one-time, one-year Renewal IHA following notice to the public providing an additional 15 days for public comments when (1) up to another year of identical or nearly identical, or nearly identical, activities as described in the **Description of Proposed Activities** section of this notice is planned or (2) the activities as described in the **Description of Proposed Activities** section of this notice would not be completed by the time the IHA expires and a Renewal would allow for completion of the activities beyond that described in the *Dates and Duration* section of this notice, provided all of the following conditions are met:

- A request for Renewal is received no later than 60 days prior to the needed Renewal IHA effective date (recognizing that the Renewal IHA expiration date cannot extend beyond one year from expiration of the initial IHA).
- The request for Renewal must include the following:

(1) An explanation that the activities to be conducted under the requested Renewal IHA are identical to the activities analyzed under the initial IHA, are a subset of the activities, or include changes so minor (*e.g.*, reduction in pile size) that the changes do not affect the previous analyses, mitigation and monitoring requirements, or take estimates (with the exception of reducing the type or amount of take).

(2) A preliminary monitoring report showing the results of the required monitoring to date and an explanation showing that the monitoring results do not indicate impacts of a scale or nature not previously analyzed or authorized.

Upon review of the request for Renewal, the status of the affected species or stocks, and any other pertinent information, NMFS determines that there are no more than minor changes in the activities, the mitigation and monitoring measures will remain the same and appropriate, and the findings in the initial IHA remain valid.

Dated: May 17, 2022.

Kimberly Damon-Randall,
Director, Office of Protected Resources,
National Marine Fisheries Service.